What Is Claimed Is:

1. A method for performing differential signaling through parallel ports in a manner that reduces noise caused by coupling between neighboring ports, comprising:

transmitting a number of differential signals from a sender to a receiver through parallel ports;

wherein the parallel ports are organized in a two-dimensional grid;

wherein each differential signal is transmitted through a first port and a second port that carry complementary positive and negative components of the differential signal;

wherein the first and second ports of a differential pair are diagonally adjacent to each other in the two-dimensional grid;

whereby because the first and second ports transition in opposite directions, coupling noise is cancelled on a neighboring port that is horizontally adjacent to the first port and vertically adjacent to the second port, and wherein a transition on the neighboring port couples equally to the first and second ports and is consequently rejected as common-mode noise by a corresponding differential receiver.

2. The method of claim 1, wherein four differential pairs in the two-dimensional grid are arranged into a tiling pattern that can be replicated to cover the two-dimensional grid, wherein:

a second component of a first pair is adjacent to the northeast of a first component of the first pair;

a first component of a second pair is adjacent to the north of the first component of the first pair and is adjacent to the west of the second component of the first pair;

a second component of the second pair is adjacent to the northwest of the first component of the second pair;

a first component of a third pair is adjacent to the north of the first component of the second pair and is adjacent to the east of the second component of the second pair;

a second component of the third pair is adjacent to the northeast of the first component of the third pair;

a first component of a fourth pair is adjacent to the north of the second component of the first pair, is adjacent to the east of the first component of the third pair, and is adjacent to the south of the second component of the third pair; and

a second component of the fourth pair is adjacent to the southeast of the first component of the fourth pair, and is adjacent to the east of the second component of the first pair.

3. The method of claim 1,

wherein sender ports are located on or near the surface of a first semiconductor chip;

wherein receiver ports are located on or near the surface of a second semiconductor chip; and

wherein the first and second semiconductor chips are positioned face-to-face so that receiver ports overlap sender ports to facilitate communication between the first semiconductor chip and the second semiconductor chip.

4. The method of claim 1, wherein sender and receiver ports are capacitive plates positioned so that voltage changes on sender plates cause voltage changes on corresponding receiver plates through capacitive coupling.

5. The method of claim 1, wherein sender and receiver ports are conductive pads positioned to be in contact with each other, thereby creating a conductive path for current flow between sender ports and corresponding receiver ports.

6. The method of claim 5, wherein the conductive pads are coupled together through wires which create conductive paths between sender ports and corresponding receiver ports.

7. The method of claim 1, wherein sender and receiver ports are wire loops positioned so that current flow in sender loops causes current to flow in corresponding receiver loops through inductive coupling.

8. The method of claim 1,

wherein the sender ports are optical signal generators;

wherein the receiver ports are photo-detectors; and

wherein the sender ports and receiver ports are positioned so that optical signals can be transmitted from sender ports to corresponding receiver ports.

9. The method of claim 1, wherein ports can have one of the following shapes:

square;

diamond;

round; and

oval.

10. An apparatus for performing differential signaling through parallel ports in a manner that reduces noise caused by coupling between neighboring ports, comprising:

a set of parallel ports for transmitting differential signals from a sender to a receiver;

wherein the set of parallel ports is organized in a two-dimensional grid;

wherein each differential signal is transmitted through a first port and a second port that carry complementary positive and negative components of the differential signal;

wherein the first and second ports of a differential pair are diagonally adjacent to each other in the two-dimensional grid;

whereby because the first and second ports transition in opposite directions, coupling noise is cancelled on a neighboring port that is horizontally adjacent to the first port and vertically adjacent to the second port, and wherein a transition on the neighboring port couples equally to the first and second ports and is consequently rejected as common-mode noise by a corresponding differential receiver.

11. The apparatus of claim 10, wherein four differential pairs in the two-dimensional grid are arranged into a tiling pattern that can be replicated to cover the two-dimensional grid, wherein:

a second component of a first pair is adjacent to the northeast of a first component of the first pair;

a first component of a second pair is adjacent to the north of the first component of the first pair and is adjacent to the west of the second component of the first pair;

a second component of the second pair is adjacent to the northwest of the first component of the second pair;

a first component of a third pair is adjacent to the north of the first component of the second pair and is adjacent to the east of the second component of the second pair;

a second component of the third pair is adjacent to the northeast of the first component of the third pair;

a first component of a fourth pair is adjacent to the north of the second component of the first pair, is adjacent to the east of the first component of the third pair, and is adjacent to the south of the second component of the third pair; and

a second component of the fourth pair is adjacent to the southeast of the first component of the fourth pair, and is adjacent to the east of the second component of the first pair.

12. The apparatus of claim 12,

wherein sender ports are located on or near the surface of a first semiconductor chip;

wherein receiver ports are located on or near the surface of a second semiconductor chip; and

wherein the first and second semiconductor chips are positioned face-to-face so that receiver ports overlap sender ports to facilitate communication between the first semiconductor chip and the second semiconductor chip.

13. The apparatus of claim 10, wherein sender and receiver ports are capacitive plates positioned so that voltage changes on sender plates cause voltage changes on corresponding receiver plates through capacitive coupling.

14. The apparatus of claim 10, wherein sender and receiver ports are conductive pads positioned to be in contact with each other, thereby creating a conductive path for current flow between sender ports and corresponding receiver ports.

15. The apparatus of claim 14, wherein the conductive pads are coupled together through wires which create conductive paths between sender ports and corresponding receiver ports.

16. The apparatus of claim 10, wherein sender and receiver ports are wire loops positioned so that current flow in sender loops causes current to flow in corresponding receiver loops through inductive coupling.

17. The apparatus of claim 10,

wherein the sender ports are optical signal generators;

wherein the receiver ports are photo-detectors; and

wherein the sender ports and receiver ports are positioned so that optical signals can be transmitted from sender ports to corresponding receiver ports.

18. The apparatus of claim 10, wherein ports can have one of the following shapes:

square;

diamond;

round; and

oval.

19. An computer system that performs differential signaling through parallel ports in a manner that reduces noise caused by coupling between neighboring ports, comprising:

a processor;

a memory;

a set of parallel ports within the processor and/or the memory for transmitting differential signals from a sender to a receiver;

wherein the set of parallel ports is organized in a two-dimensional grid;

wherein each differential signal is transmitted through a first port and a second port that carry complementary positive and negative components of the differential signal;

wherein the first and second ports of a differential pair are diagonally adjacent to each other in the two-dimensional grid;

whereby because the first and second ports transition in opposite directions, coupling noise is cancelled on a neighboring port that is horizontally adjacent to the first port and vertically adjacent to the second port, and wherein a transition on the neighboring port couples equally to the first and second ports and is consequently rejected as common-mode noise by a corresponding differential receiver.

20. The computer system of claim 19, wherein four differential pairs in the two-dimensional grid are arranged into a tiling pattern that can be replicated to cover the two-dimensional grid, wherein:

a second component of a first pair is adjacent to the northeast of a first component of the first pair;

a first component of a second pair is adjacent to the north of the first component of the first pair and is adjacent to the west of the second component of the first pair;

a second component of the second pair is adjacent to the northwest of the first component of the second pair;

a first component of a third pair is adjacent to the north of the first component of the second pair and is adjacent to the east of the second component of the second pair;

a second component of the third pair is adjacent to the northeast of the first component of the third pair;

a first component of a fourth pair is adjacent to the north of the second component of the first pair, is adjacent to the east of the first component of the third pair, and is adjacent to the south of the second component of the third pair; and

a second component of the fourth pair is adjacent to the southeast of the first component of the fourth pair, and is adjacent to the east of the second component of the first pair.

21. The computer system of claim 19,

wherein sender ports are located on or near the surface of a first semiconductor chip;

wherein receiver ports are located on or near the surface of a second semiconductor chip; and

wherein the first and second semiconductor chips are positioned face-to-face so that receiver ports overlap sender ports to facilitate communication between the first semiconductor chip and the second semiconductor chip.

22. The computer system of claim 19, wherein sender and receiver ports are capacitive plates positioned so that voltage changes on sender plates cause voltage changes on corresponding receiver plates through capacitive coupling.

23. The computer system of claim 19, wherein sender and receiver ports are conductive pads positioned to be in contact with each other, thereby creating a conductive path for current flow between sender ports and corresponding receiver ports.

24. The computer system of claim 23, wherein the conductive pads are coupled together through wires which create conductive paths between sender ports and corresponding receiver ports.

25. The computer system of claim 19, wherein sender and receiver ports are wire loops positioned so that current flow in sender loops causes current to flow in corresponding receiver loops through inductive coupling.

26. The computer system of claim 19,

wherein the sender ports are optical signal generators;

wherein the receiver ports are photo-detectors; and

wherein the sender ports and receiver ports are positioned so that optical signals can be transmitted from sender ports to corresponding receiver ports.

27. The computer system of claim 19, wherein ports can have one of the following shapes:

square;

diamond;

round; and

oval.